

UBC Social Ecological Economic Development Studies (SEEDS) Sustainability Program

Student Research Report

**The Investigation of Time Distribution for Physical Activity for  
Self-Identified Female Chinese (including Macao and Taiwanese) Students at UBC**

**Nicolas Choy, Tian Rabbani, Jeevun Riar, Julia Rudecki, Madelyn Brunt**

**University of British Columbia**

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## **EXECUTIVE SUMMARY**

Recently, the University of British Columbia (UBC) Undergraduate Experience Survey (UES) International Physical Activity Questionnaire (IPAQ) revealed that females from Asian Ethnic groups are the least involved with physical activity (PA) and recreation at the UBC. This project looks at self-identified Chinese female students (including Macao and Taiwanese students), and examines the potential barriers that limit their engagement in recreational PA. In this study, we will be utilizing a time mapping method. Time mapping is a tool which will allow us to visualize the *actual* amount of time passed engaging in given activities on different days. This will allow us to see how these students are spending their day hour by hour, and how they transition from one activity to the next. As “lack of time” was a major commonality in much of our preliminary research (Yanz & Cardinal, 2012; Im et al., 2012; Daniel, Abendorth, & Erlen, 2017; Im & Choe, 2004), time-mapping will likely be a valuable tool to identify how self-identified Chinese females at UBC spend their time, and see if hypothetically they are able to incorporate PA into their schedules.

Recruitment for this study was conducted through convenience sampling in which the SEEDS network, UBC AMS club pages, various UBC undergraduate pages, and social media was used. We found that social media was a strong outlet in yielding the most participants. Through this recruitment process, 15 individuals voluntarily agreed to participate, which required them to complete a Qualtrics survey and an excel document, mapping out three days’ worth of activity of their week. Due to the large target demographic, a survey was used alongside an excel document to properly identify participants’ delegation of time throughout the week. The survey included both multiple choice questions as well as open-ended questions to encapsulate

the most data around potential time barriers. Questions in the survey primarily focused on aspects like how students delegated their time, whether they commuted to UBC or lived on campus, if they were aware of the various opportunities provided by UBC recreation, and the main factors limiting their involvement.

Through analysis of the data, there were four key themes that were prevalent across participants. We have found four outcomes from the present study: self efficacy is a barrier to PA, PA is not a high priority, individuals feel too fatigued to engage in PA, and lack of time for PA. Participants expressed that they were uncertain on what activity they should partake in at the gym, and how to do so. The second theme was not prioritizing PA. Students knew the fundamental benefits of PA, yet they prioritized school, work, family, and sleep more. In addition, many mentioned that free time to participate in other activities decreases while workload increases as the semester goes on. Further, students articulated that they felt excessively fatigued after going through their busy schedules to partake in any exercise. The fourth and final theme was a “lack of time” to engage in PA. This was mostly due to long commutes, which reduces the time in the day in which individuals can exercise.

Taking the findings into consideration, four recommendations or plans to action were suggested. The first is to utilize strong communication channels (such as social media) to reach out to this demographic, as it is known that technology has an immense influence on how information is disseminated (Ferguson et al., 2014). The second recommendation, stemmed from the first, is the creation of advertisements and infographics catering to students of all athletic levels through using popular social media channels. When creating advertisements, it is suggested that a picture of a Chinese, Macao, or Taiwanese athlete is used to cater to the

demographic we seek to reach out to. The third recommendation is creating female-only gym times. With the implementation of the ARC, gym accessibility is increased which could allow potential hours to be dedicated to female-only students. For example, at the ARC, Monday, Wednesday, and Friday at 7pm-8pm could be dedicated to female students. This would limit the perception of the gym being a masculine dominated or intimidating environment. Our final recommendation is creating programs that cater to these busy schedules. For example, UBC could implement a program in which the same content would occur twice a week. This would allow students to pick and choose which day suits their needs the best, and it would avoid the students feeling left out having missed a day of the program.

## **INTRODUCTION**

A plethora of research has been conducted on the lack of PA participation within various demographic groups. Such research emphasizes the importance of PA, and brings attention to the barriers individuals face with regards to participation and engagement in regular PA. A barrier that has often been reported to be experienced by post-secondary students is a lack of time (Greaney, White, Dayton, Riebe, Blissmer, et al., 2009; Nelson, Lytle & Perry, 2009; LaCaille, Dauner, Krambeer & Pendersen, 2011). Time-related barriers, such as time management, are ubiquitous among student populations as many spend a great amount of time engaging in study-related sedentary behaviors (Deliens, Deforche, Bourdeaudhuij & Clarys, 2015). At UBC, specific demographic populations have been found to be underrepresented in participation in recreation and PA (Kim, 2018). For this reason, further research on the various barriers that play a role in the underrepresentation of specific population groups such as self-identified female Chinese and Taiwanese (including Hong Kong and Macao) students at UBC, in PA participation

is being conducted. Amidst these research initiatives at UBC is the time mapping study. Working alongside SEEDS community partners at UBC, the study aims to identify the time barriers preventing PA. Time mapping is a tool that is utilized to observe the amount of time individuals *actually* spend performing given activities on different days of the week. Within our project, time mapping has been used to inform us on how self-identified Chinese and Taiwanese (including Hong Kong and Macao) female undergraduates spend their day-to-day lives, and how they transition from one activity to another. By participating in this project, we are able to contribute to the sustainability program at UBC as the information collected as part of our SEEDS project will serve to support the goals of the Equity Enhancement Fund project which is conducted by the Department of Physical Activity Office at UBC. Thus, the project will be able to help the Office make improvements in access and participation in PA programs and recreation for UBC community members to further promote health and wellbeing at UBC.

The purpose of our project was to understand how and why female students who self-identify as Chinese or Taiwanese (including Hong Kong and Macao) plan and prioritize the amount of time that is dedicated to PA on a regular basis. Moreover, an objective of our project was to generate a greater depth of knowledge and understanding with respect to why female undergraduates who self-identify as Chinese or Taiwanese at UBC have been found to have low participation rates in PA and recreation on campus through an Undergraduate Experience Survey. Lastly, our project aims to utilize this understanding and knowledge to help generate recommendations in communication or programming that could assist with increasing PA for this specific demographic.

The main contacts maintained throughout the project's development were with Sally Lin, the project coordinator of the SEEDS Sustainability Program at UBC, and Lyz Gilgunn, the PA manager for the department of Athletics and Recreation at UBC. Sally and Lyz were helpful resources in providing the study with background information, assisting in the formulation of the methodology, and providing feedback on deliverables. Sally was able to help with the recruitment process by utilizing the SEEDS network, and connecting us with reliable references to guide the project.

## **LITERATURE REVIEW**

There is indisputable evidence that regular PA is linked to improved health and a reduction in the prevalence of many chronic diseases (Warburton, Nicol, & Bredin, 2006). Individuals benefit from PA in the short term through improved cardiorespiratory and muscular fitness, bone health, and favorable body composition (National Centre for Chronic Disease Prevention, 2011). In addition, PA enhances psychological well-being, self-esteem, and it is vital for a healthy lifestyle (Duncan, Judith, & Hagan, 2007). As a result, any barriers that limit PA levels should be eliminated.

It is known that recreation programs can exclude certain subpopulations, especially females, ethnic minority groups, LGBTQ communities, First Nations peoples, and individuals living with disabilities. A recent UBC Undergraduate Experience Survey (UES) and International Physical Activity Questionnaire (IPAQ) section disclosed that the lowest self-reported levels of PA were from women of Asian ethnic groups. This is highly problematic, as there are a large number of Asian ethnic groups (i.e Chinese, Taiwanese, and Hong Kong)

enrolled at the UBC (Redish & Mathieson, 2017). Moreover, this group represents the greatest increase in enrollment trends from 2012 – 2016 (Redish & Mathieson, 2017). Thus, it is paramount that we identify barriers to PA faced by self-identified female Chinese undergraduate students at UBC.

The finding of low levels of PA among female Asian students at UBC is not an anomaly. A 2010 study compared PA patterns among Asian, African, White, and Hispanic American college students. Of all the ethnicities, female Asian students had the highest rates of physical inactivity (Suminski, Petosa, Utter, Zhang, 2010). Another study which systematically reviewed the existing literature concluded that South Asian women consistently do not meet the recommended PA levels for health benefits (Babakus & Thompson, 2012).

There has been a number of research studies examining why this may be. Yanz & Cardinal (2012) interviewed Chinese female international students at an American school. The students identified a number of barriers that prevented them from engaging in PA at university. These included a lack of time, limited self-efficacy, low social support, cultural barriers, and a lack of “how-to” information (Yanz & Cardinal, 2012). Another study which considered Asian women’s attitudes towards PA found three major themes: keeping traditions, not a priority, and perceived PA to be “not for Asian girls”. Asian women in this study gave high priority to cultural traditions and children, claiming that there isn’t enough time for PA. Furthermore, they perceived that their “weak and small” female bodies were not appropriate for exercise (Im et al., 2012). Daniel, Abendorth, & Erlen (2017) recently identified four common barriers to PA according to a focus group of South Asian immigrant women. These comprised of lack of time,

low interest, decreased social support, and environmental constraints (Daniel, Abendorth, & Erlen, 2017).

It is important to note that attitudes toward PA influence participation (Kafatos et al., 1999; Margetts et al., 1999). From our preliminary research, it appears that Asian women have different attitudes than Western beliefs. One study examined how Western biomedical views of PA and related health practices contrast with Traditional Chinese medicine's conceptions of health and exercise (Jette & Vertinsky, 2011). The major finding was that Chinese participants perceived exercise as a pleasurable activity, that improves happiness and enhances their lives. This contrasts to the Western belief that exercise is a personal responsibility to health (Jette & Vertinsky, 2011). Participants viewed exercise as akin to activities such as painting, singing, and volunteering (Jette & Vertinsky, 2011).

Another study examined Korean women's attitudes towards PA. Korean women in this study all had a holistic view of PA. The women viewed all physiological functions as PA. This includes breathing, sleeping, digesting, and having one's heart beating. They considered human interactions to be PA., and even brain activity, such as thinking, to be PA. Many of them considered specific PA, such as tennis, golf, and swimming, as optional activities that they liked to have as hobbies. Women rarely engaged in exercise due to their busy lives (Im & Choe, 2004). This research can help us understand why female Asian individuals in general have lower PA levels.

However, these findings are not necessarily an accurate portrayal of the female Asian population at UBC. Preceding SEEDS projects have identified barriers to PA such as lack/inconvenience of time and poor communication from local students at UBC (Lee, O'Neil,



Happeney, Wright, & Vit, 2018), yet there is a gap in the research from our target population: female Asian UBC students. This project hopes to address this gap.

## **METHODOLOGY**

### *Description of Methods Used*

For our study, we required each participant to complete a survey through Qualtrics composed of qualitative and quantitative questions, taking approximately five minutes to complete. Participants also filled out their daily schedule on an excel sheet for three days of the week when they were on the UBC campus the most. All participants were aware that all personal information is kept confidential. The survey consisted of 27 questions pertaining to demographics, perception of PA, barriers and facilitators that helped them fit PA into their schedule, and preferences for time and activity of a potential program. The questions included in our survey were specifically tailored towards our target demographic group of self-identifying Chinese and Taiwanese female UBC students. A total of 15 participants completed the survey and excel sheet. Quantitative data from the Qualtrics survey was analyzed using descriptive statistics through excel, and thematic analysis was used to derive themes from the qualitative data. All excel sheets were analyzed to determine common times of the day when students were most available.

### *Rationale for Method Used*

Prior to establishing our methodology, we met with our community partners to establish project goals, expectations, and possible routes for recruiting and collecting participant data. After our community partner meeting, our group had difficulties determining a suitable method for this project due to the lack of previous literature on time-mapping. Most literature suggested using time-mapping for future studies, however, we were unable to locate a study which implemented this tool to collect data. Thus, our group initially considered interviewing participants through the use of focus groups, however, our community partners and additional UBC staff directed us towards using surveys. This was due to lack of time, recruitment difficulties, and resources that are required to run a successful focus group. Thus, surveys appeared to be a viable alternative for collecting time-related data in an efficient and effective way. Literature has also shown focus group results and survey results to be similar to each other, and would lead program planners to the same conclusions regarding program design (Ward, Bertrand, & Brown, 1991). Our project also includes collecting quantitative time-related data, and focus groups are not an appropriate method when measuring quantitative components (Ward et al., 1991). As a result, we collected data primarily through the use of a survey and an excel sheet to accurately document activities that occur during a participant's day.

### *Challenges and Limitations*

There were significant limitations in terms of recruitment because participants found the combination of completing the survey and excel sheet, along with emailing the excel sheet to our team to be extremely time-consuming. This resulted in a small sample size and reduced the generalizability of our results. Our recruitment process was also primarily by word of mouth, so

most of our participants were from our own social circles and mostly domestic students, which ultimately resulted in a lack of diversity of our target population. Furthermore, many of our qualitative questions received relatively short responses, producing less rich data and further decreasing generalizability of sample to target population. This may have also resulted due to respondent fatigue from the number of survey and open-ended questions being asked, leading to a decreased quality in response (O'Reilly-Shah, 2017).

## **PROJECT OUTCOMES/FINDINGS/DISCUSSION**

From the 15 responses analyzed, we have established themes for the three open-ended survey questions that are most related to impact of time on PA participation among Asian female students at UBC. Themes were determined through the use of thematic analysis and grouping responses that contained similar elements. We have found four outcomes from the present study: Self efficacy is a barrier to PA, PA is not a high priority, individuals feel too fatigued to engage in PA, and lack of time to engage in PA. These themes were determined based on the responses from our question asking “What hinders you from fitting physical activity in your schedule?”.

First of all, participants found self efficacy in the gym to be a barrier to PA. One participant stated “[The gym] was somewhat intimidating, since I didn’t know what I was doing at the gym. As a result, I don’t go.”. This directly aligns with previous literature on barriers of PA participation. Research has indicated that self-efficacy is a powerful predictor of PA (Rodgers & Sullivan, 2006). Moreover, Yan & Cardinal identified that Chinese female graduate students identified that they had low self efficacy in their PA abilities (Yan & Cardinal, 2012). Our respondents feeling dubious in their abilities to use the equipment in the gym is consistent

with the literature describing self-efficacy as a common barrier to PA. Ultimately, this will lead us to providing recommendations to increasing self-efficacy amongst this demographic.

Another common theme among participants was a low prioritization of PA. Participants found it difficult to fit in exercise alongside their work, school, and commute schedule, and it was especially difficult during periods of heavy school workload. A participant stated “I find I prioritize most things over it [PA] and it’s usually a last thought under studying and spending time with family and friends or even sleeping.” Another participant reflected “During midterm season, I have less physical activity given that I have to ensure that I am on top of my studies.” These findings are common among Asian ethnic groups in the literature. One study indicated that Asian women in America gave high priority to other things, like cultural traditions and their children, and expressing that exercise was not a primary concern (Im et al., 2012). Additionally, Im & Choe identified that Korean women neglected to engage in PA because of their “busy schedules” (Im & Choe, 2004). Furthermore, Im et al. (2012) found that Asian American women did not prioritize PA over intellectual activities because they mentioned that they were taught to spend their time and energy on academic pursuits, rather than PA. PA was only pursued with any “leftover time” (Im et al., 2012). Clearly, PA is not as important to this demographic as other activities, making them a lower priority.

A third finding from our study was that participants felt excessively fatigued from their busy days, and didn’t have the energy to engage in PA. A participant articulated “What hinders me from fitting physical activity in my schedule are long work and school days which are sometimes combined. After doing a full 8 or 10 hour shift, the last thing I want to do is any physical activity after standing up all day.” Another respondent said that they are “usually quite

tired during the week”. Although this may or may not reflect the beliefs of our study population, the literature has indicated that Korean women perceive all physiological functions to be PA. Korean women in this study all had a holistic view of what PA is - they considered all physiological functions to be PA (Im & Choe, 2004). Perhaps, our respondents think that “standing up all day” is sufficient enough to “count” as PA.

Finally, a lack of time was identified to be a barrier to PA. Our respondents singled out commuting to be a major reason for this. For example, one participant said “commuting takes a lot of time out of my day so I have less time to study and exercise.” Another responded “I also mostly use transit everywhere, so transiting to a gym if I am coming from home or work takes a lot more time up in my day.” Most students in this study were commuters who averaged 1 to 1.5 hours of commuting, and this displaced time away from their day to participate in PA. This is consistent with the literature. A study of over 34,000 workers found that individuals who commute more than 30 minutes to work are significantly less active than those who commute less than 30 minutes (Anderson, 2017). In addition, Yan & Cardinal found that Chinese students in America claimed that they “did not have enough time” to be physically active (Yan & Cardinal, 2012). Commuting take up a lot of time in the day, and is a barrier to PA. Strategies to help commuters become more physically active is necessary.

These four outcomes, which were identified to respondents in our survey, are extremely useful to consider in order to develop strategies to increase PA levels among female Asian ethnic groups.

## **RECOMMENDATION**

From the outcomes of the present study, we have made four primary recommendations for the SEEDS community partner in regards to barriers limiting recreational engagement at UBC. These suggestions are targeted towards self-identified female Chinese students (including Macao and Taiwanese students) at UBC. Our recommendations are as follows: utilization of strong communication channels, creating advertisements and infographics, creating female-only gym times, and implementation of a time inclusive program.

The first recommendation is the utilization of strong communication channels such as social media. Recognizing social media's potential in the dissemination of information, creating regularly used networks on platforms such as Twitter or Instagram will be extremely beneficial in reaching out to this demographic (Arceneaux & Dinu, 2018). Through these channels, advertisements which cater to all athletic levels should be implemented (Belanger, Bali, & Longden, 2014). When creating these advertisements, it is also important to consider using athletes appropriate to the demographic. Advertisements which include a female Asian ethnic athlete would be important to incorporate, as the target demographic would see themselves represented and have a role model to emulate.

Our second recommendation is to create infographics and pamphlets for students that promote physical literacy (Otten, Cheng, & Drewnowski, 2015). As self-efficacy was identified to be a major barrier to PA participation (Yan & Cardinal, 2012), this recommendation can help increase individuals self-efficacy, as they will feel like they have a better idea of what they are doing. Many students know the baseline benefits of PA, but don't recognize how PA can help with other parts of their lives as well. Therefore, through promotion of physical literacy, it can teach and demonstrate the underlying benefits PA can have. For example, it can be assumed that

it is common knowledge that PA helps an individual feel good on a regular basis. However, many students that prioritize their studies over PA may not recognize that PA can help improve their studies as well. Furthermore, one participant expressed uncertainty as to how to do or what to do at the gym. Infographics and pamphlets can help to aid students that are uncertain on how to or what to do at the gym.

The third recommendation is creating female-only gym times. Many participants reported that the gym had a masculine dominated and daunting connotation which resulted in many avoiding the gym. Having recognized this as a consistent result within the research, female-only gym times may be beneficial in providing a space for female students to comfortably work out and partake in activity (Craig & Liberti, 2007). Feasibility was taken into consideration, and we felt that the implementation of the ARC provides increased opportunities to allow female-only gym times. Each session does not have to be lengthy, for example we discussed that having an hour long female-only gym time two or three times a week will likely increase participation.

The fourth and final recommendation is promoting and creating programs which cater to students' varying schedules. A study has shown that individuals that participate in moderate-levels of activity are more likely to maintain the lifestyle later on in life in comparison to low-levels or high-levels of activity (Baker et al., 2005). As a result, a program that caters to the various schedules, but still giving autonomy to allow students to create meaning through participation can be favourable (Maloney, 2018). For example, a program that runs twice a week for an hour each in which the contents in the given week is the same may allow students the autonomy to pick and choose which day fits their schedule better. Since "lack of time" was a major commonality among respondents and in much of our preliminary research (Yan &

Cardinal, 2012; Im et al., 2012; Daniel, Abendorth, & Erlen, 2017; Im & Choe, 2004), this will likely be a valuable tool to help individuals incorporate PA into their busy schedules.

## **CONCLUSION**

The purpose of this study was to dissect why self-identified Chinese and Taiwanese (including those from Hong Kong and Macao) female undergraduate students have been reported to participate in PA the least among various ethnic groups. The specific variable investigated in this study was time and how participants prioritized daily tasks and PA in their busy schedules. Results have indicated that female Asian undergraduate students report a largely reduced amount of time dedicated to PA. Qualitative and thematic analyses have discovered that this population of female students prioritize academics more than participation in PA, which is a prime reason for the displacement of time spent away from PA. As such, appropriate recommendations have been generated in an attempt to increase the PA variable among this cohort of female students. The recommendations promote the use of social media channels to advertise PA opportunities, using infographics to enhance physical literacy, implementation of female-only gym times, and creating PA programs that accommodate busy student schedules. This study and future research will contribute to knowledge regarding the low self-reported PA participation among self-identified female Chinese and Taiwanese undergraduate students at UBC. Opportunities for future research may surround comparing time allocation to PA among different ethnic groups; setting guidelines on the definition of PA as per the individual to perhaps encompass a broader range of activity opportunities; and exploring participant turnout in low-commitment PA programs.



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